Digital Phosphor Oscilloscopes

▶ TDS3012B • TDS3014B • TDS3032B • TDS3034B • TDS3052B • TDS3054B

COMPUTING COMMUNICATIONS VIDEO

The TDS3000B Series of Digital Phosphor Oscilloscopes Provides Unmatched Performance and Portability at an Affordable Price

The TDS3000B packs the power of digital phosphor oscilloscope technology, WaveAlert™ automatic anomaly detection, OpenChoice™ documentation and analysis solutions with e*Scope® web-based remote control, and five application-specific modules into a lightweight, battery-capable design.

DPO Technology Provides a Greater Level of Insight Into Complex Signals

DPO technology delivers superior insight into complex signals with the ability to display, store and analyze three dimensions of signal information in real-time: amplitude, time, and distribution of amplitude over time. Fast waveform capture rates make it easier to capture and display infrequent waveforms or waveform variations, while the intensity graded display helps you locate and characterize waveform anomalies that can be elusive on traditional digital storage oscilloscopes.

Enhanced Troubleshooting Ability

WaveAlert™ waveform anomaly detection speeds your troubleshooting tasks by helping you find those elusive problems faster. WaveAlert detection monitors the incoming signals on all channels and will detect and highlight any waveform that deviates from the normal waveform being acquired. Because the TDS3000B oscilloscope can stop acquisition, sound a beep, make a hard copy or save the waveform when it detects an anomaly, you can run tests over long time periods – even unattended – to find those challenging, very infrequent failures.

▶ **Features & Benefits**

500 MHz, 300 MHz, and 100 MHz Bandwidths

Sample Rates up to 5 GS/s

2 or 4 Channels

Full VGA Color LCD

25 Automatic Measurements

9-Bit Vertical Resolution

FFT Standard

Multi-language User Interface

QuickMenu Graphical User Interface for Easy Operation

WaveAlert™ Automatic Waveform Anomaly Detection

OpenChoice™ Solutions Simplify Instrument Control, Documentation and Analysis
– e*Scope® Web-based Remote Control
– Built-in Ethernet Port
– GPIB, RS-232, VGA Interfaces
– TDSPCS1 OpenChoice™ Software
– WaveStar™ Software
– Integration with Third-party Software

Application Modules for Specialized Analysis
– Advanced Analysis Module
– Limit Testing Module
– Telecommunications Mask Testing Module
– Extended Video Module
– 601 Serial Digital Video Module

Plug-in Printer for Portable Documentation of Results

TekProbe™ Interface Supports Active, Differential and Current Probes for Automatic Scaling and Units
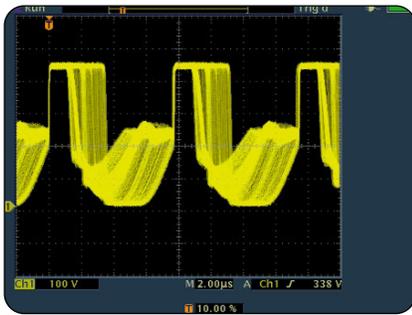
▶ **Applications**

Digital Design and Debug

Video Installation and Service

Power Supply Design

Education and Training

Telecommunications Mask Testing

Manufacturing Test

General Bench Test

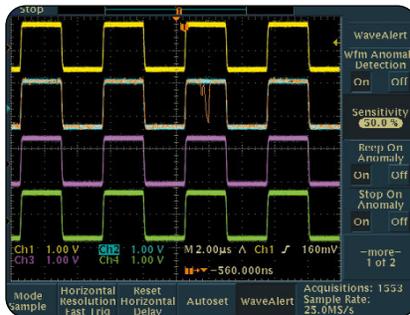**Tektronix**
Enabling Innovation
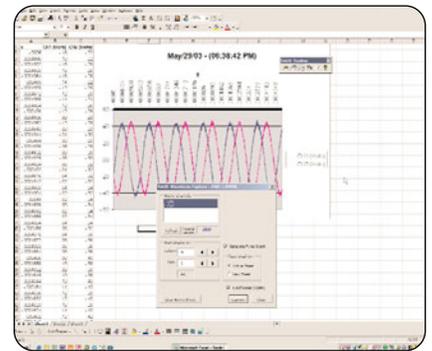
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▶ *DPO technology shows modulation effects on a power supply control loop.*

▶ *WaveAlert™ waveform anomaly detection alerts you to any waveform that deviates from the "normal" input.*

▶ *Easily document and analyze measurement results using OpenChoice™ software.*

Simple, Speedy Documentation and Analysis

OpenChoice™ solutions deliver simple, seamless integration between the oscilloscope and the PC. Using a standard, built-in Ethernet port, TDS3GV optional communication module, floppy disk, TDSPCS1 OpenChoice software and integration with third-party software, and e*Scope web instrument control, the TDS3000B Series provides you with multiple choices to easily capture, transfer, document, and analyze your measurement results. This seamless integration extends the power and value of these brilliantly engineered, ultra-affordable oscilloscopes.

e*Scope® Web-based Remote Control

e*Scope means you can control your TDS3000B oscilloscope from anywhere, using the Internet and your PC. Simply connect the TDS3000B oscilloscope to your LAN via its built-in Ethernet port, open a browser window on your PC and enter the TDS3000B oscilloscope's IP address in the Address window. The oscilloscope will respond, allowing you to control it from your browser. Download e*Scope control software to your PC for a graphical interface that displays the TDS3000B oscilloscope screen and front panel controls for easy access.

## Flexible Features for Every Application

Optional application modules enable you to transform your oscilloscope into a specialized tool for limit testing, telecommunications mask testing, and video troubleshooting. And, with its lightweight, compact size and battery pack, the TDS3000B Series oscilloscope can go wherever it is needed. It weighs only 4.5 kilograms, with battery installed. Use the optional plug-in thermal printer to instantly document your work, even in the field.
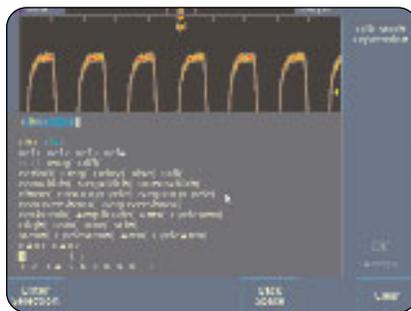
▶ **TDS3AAM Advanced Analysis Module –** Adds extended math capability, arbitrary math expressions, measurement statistics and additional automated measurements.

▶ **TDS3LIM Limit Testing Module –** Offers fast, accurate Go/No Go verification that tested circuits are operating within intended parameters.

▶ **TDS3TMT Telecommunications Mask Testing Module –** Pass/Fail compliance of ITU-T G.703 and ANSI T1.102 standards, custom mask testing and more.

▶ **TDS3VID Extended Video Editing Module –** Adds Video QuickMenu, autoset, holdoff, line count trigger, video picture mode, vectorscope mode, HDTV format triggering graticules and more.

▶ **TDS3SDI 601 Serial/Digital Video Module –** Identify and analyze ITU-R BT.601 video signals, video picture mode with bright line select, vectorscope mode, HDTV format triggering and more.
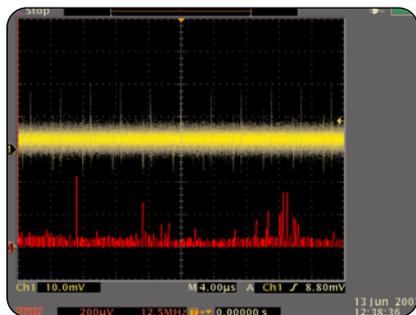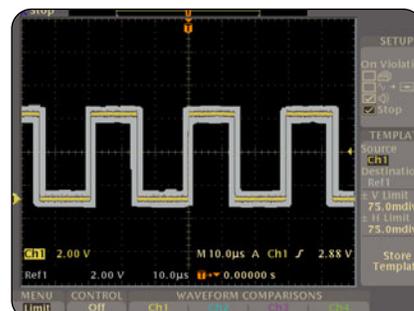
▶ *Look for unintentional circuit noise with the TDS3000B Series' FFT capability.*

▶ *TDS3AAM Advanced Analysis module delivers advanced waveform math.*

▶ *The TDS3000B DPO with the TDS3LIM limit testing module is ideal for manufacturing test applications where fast Go/No-Go decisions are required.*

▶ Characteristics

▶ TDS3000B Series Electrical Characteristics

|	TDS3012B	TDS3014B	TDS3032B	TDS3034B	TDS3052B	TDS3054B
Bandwidth	100 MHz	100 MHz	300 MHz	300 MHz	500 MHz	500 MHz
Channels	2	4	2	4	2	4
Sample Rate on Each Channel	1.25 GS/s	1.25 GS/s	2.5 GS/s	2.5 GS/s	5 GS/s	5 GS/s
Maximum Record Length	10 K points on all models					
Vertical Resolution	9 Bits on all models					
Vertical Sensitivity (/div)	1 mV – 10 V on all models					
Vertical Accuracy	±2% on all models[1]					
Max Input Voltage (1 MΩ)	150 V_{RMS} CAT I on all models (300 V CAT II with standard 10X probe)					
Position Range	± 5 div on all models					
BW Limit	20 MHz	20 MHz	20, 150 MHz	20, 150 MHz	20, 150 MHz	20, 150 MHz
Input Coupling	AC, DC, GND on all models					
Input Impedance Selections	1 MΩ in parallel with 13 pF or 50 Ω					
Time Base Range	4 ns – 10 s/div	4 ns – 10 s/div	2 ns – 10 s/div	2 ns – 10 s/div	1 ns – 10 s/div	1 ns – 10 s/div
Time Base Accuracy	20 ppm on all models					
Display Monitor	Color LCD					

[1] Requires TDS3AAM module.

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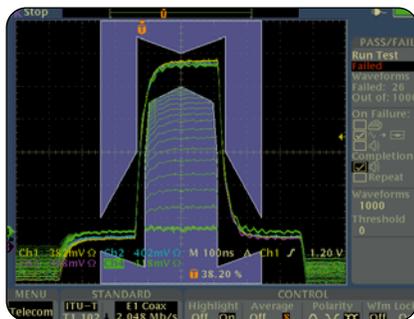
▶ *TDS3000B DPO provides breakthrough test speeds for telecommunications line card testing. The telecom QUICKMENU puts all the commonly used telecom testing functions on a single menu.*
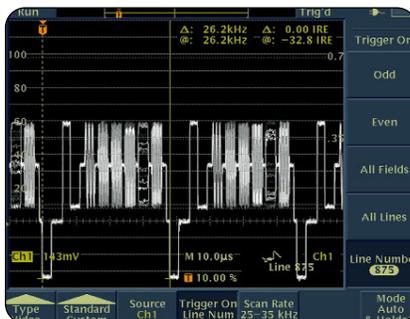
▶ *Custom video trigger allows the TDS3000B to trigger on standards such as RS343 (26.6 kHz scan rate).*

▶ *Trace and identify ITU-R BT.601 video signals with the TDS3SDI 601 serial digital video module.*

Acquisition Modes

DPO – Captures and displays complex waveforms, random events and subtle patterns in actual signal behavior. DPOs are able to provide 3 dimensions of signal information in real time: Amplitude, time and the distribution of amplitude over time.

Peak Detect – High frequency and random glitch capture. Captures glitches as narrow as 1 ns.

WaveAlert™ – Monitors the incoming signals on all channels and alerts the user to any waveform that deviates from the normal waveform being acquired.

Sample – Sample data only.

Envelope – Max/Min values acquired over one or more acquisitions.

Average – Waveform data from 2 to 512 (selectable) acquisitions is averaged.

Single Sequence – Use the Single Sequence button to capture a single triggered acquisition sequence at a time.

Trigger System

Main Trigger Modes – Auto (supports Roll Mode for 40 ms/div and slower), Normal.

B Trigger – Trigger after time or events.

Trigger After Time Range – 13.2 ns to 50 s.

Trigger After Events Range – 1 to 9,999,999 events.

External Trigger Input – >1 MΩ in parallel with 17 pF; Max input voltage is 150 V$_{RMS}$.

Trigger Types

Edge – Conventional level-driven trigger. Positive or negative slope on any channel. Coupling selections: DC, noise reject, HF reject, LF reject.

Video – Trigger on all lines, odd/even or all fields. With TDS3VID or TDS3SDI trigger on individual lines and on analog HDTV formats (1080i, 1080p, 720p, 480p).

Logic –
PATTERN: Specifies AND, OR, NAND, NOR when true or false for a specific time.

STATE: Any logic state. Triggerable on rising or falling edge of a clock. Logic triggers can be used on combinations of 2 inputs (not 4).

Pulse –
WIDTH (or GLITCH): Trigger on pulse width less than, greater than, equal to or not equal to a selectable time limit ranging from 39.6 ns to 50 s.

RUNT: Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again.

SLEW RATE: Trigger on pulse edge rates that are either faster or slower than a set rate. Edges can be rising, falling or either.

Comm (Requires TDS3TMT) – Provides isolated pulse triggering required to perform DS1/DS3 telecommunications mask testing per ANSI T1.102 standard.

Alternate – Sequentially uses each active channel as a trigger source.

Measurement System

Automatic Waveform Measurements –
Period, Frequency, +Width, –Width, Rise Time, Fall Time, +Duty Cycle, –Duty Cycle, +Overshoot, –Overshoot, High, Low, Max, Min, P-P, Amplitude, Mean, Cycle Mean, RMS, Cycle RMS, Burst Width, Delay, Phase, Area[1], Cycle Area[1].

Display any four measurements from any combination of waveforms. Or display all measurements with measurement snapshot feature.

Thresholds – Settable in percentage or voltage.

Gating – Measurements can be gated using the screen or vertical cursors.

Waveform Processing

Deskew – Channel-to-channel deskew ±10 ns may be manually entered for better timing measurements and more accurate math waveforms.

Arithmetic Operators – Add, subtract, multiply, divide.

Autoset – Single-button, automatic setup on selected input signal for vertical, horizontal and trigger systems.

Display Characteristics

Waveform Style – Dots, vectors and variable persistence.

Graticules – Full, grid, cross-hair, frame, NTSC, PAL, SECAM, vectorscope 100% and 75% color bars (with optional TDS3VID and TDS3SDI video application modules).

Format – YT, XY and Gated XYZ (XY with Z-axis blanking available on TDS30X4B only).

[1] Requires TDS3AAM module.

I/O Interface

Hard Copy Port (standard) – Centronics-type parallel.

Ethernet Port (standard) – 10Base-T LAN, RJ-45 female.

TDS3GV Communications Module – GPIB (IEEE -488.2) programmability: Full talk/listen modes; Control of all modes, settings and measurements.

VGA: Monitor output for direct display on large VGA-equipped monitors. DB-15 female connector, 31.6 kHz sync rate, EIA RS-343A compliant.

RS-232-C interface programmability: Full talk/listen modes; Control of all modes, settings and measurements. Baud Rate up to 38,400. DB-9 male connector.

Programmer manual: 071-0381-02.

Hard Copy Capability

Graphics File Formats – Interleaf (.img), TIF, PCX (PC Paintbrush), BMP (Microsoft Windows) and Encapsulated Postscript (EPS).

Printer Formats – Bubblejet, DPU-3445, Thinkjet, Deskjet, Laserjet, Epson (9- and 24-Pin).

Environmental and Safety

Temperature – +5 ºC to +50 ºC (operating), –20 ºC to +60 ºC (nonoperating).

Humidity – 20% to 80% RH below 32 ºC, derate to 30% RH at 45 ºC (operating), 5% to 90% RH below 41 ºC, derate to 30% RH at 60 ºC (nonoperating).

Altitude – To 3,000 m (operating), 15,000 m (nonoperating).

Electromagnetic Compatibility – Meets or exceeds EN55011 Class A radiated and conducted emissions; EN50082-1; FCC 47 CFR, Part 15, Subpart B, Class A; Australian EMC framework; Russian GOST EMC regulations.

Safety – UL3111-1, CSA1010.1, EN61010-1, IEC61010-1.

Physical Characteristics

INSTRUMENT

Dimensions	mm	in.
Width	375.0	14.8
Height	176.0	6.9
Depth	149.0	5.9
Weight	**kg**	**lbs.**
Instrument only	3.2	7.0
w/battery installed	4.5	9.8

INSTRUMENT SHIPPING PACKAGE

Dimensions	mm	in.
Width	502.0	19.8
Height	375.0	14.8
Depth	369.0	14.5

RACKMOUNT

Dimensions	mm	in.
Width	484.0	19.0
Height	178.0	7.0
Depth	152.0	6.0

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▶ Ordering Information

TDS3012B, TDS3014B, TDS3032B, TDS3034B, TDS3052B, TDS3054B

Standard Accessories

Probes: 2 each P3010 10X passive probes (TDS3012B), 4 each P3010 10X passive probes (TDS3014B), 2 each P6139A 10X passive probes (TDS3032B and TDS3052B), 4 each P6139A 10X passive probes (TDS3034B and TDS3054B).

Documentation: User manual (hard copy and CD), quick reference manual, programmer's manual, and application module manuals.

Power cord.

Accessory tray.

Protective front cover: Has holder for user manual and/or 3.5 in. floppy disks.

NIST-Traceable Certificate of Calibration.

Please specify power plug and manual version when ordering.

Recommended Option

Option BND – Available on all TDS3014B, TDS3034B and TDS3054B models. Includes TDS3GV communication module with OpenChoice™ software, TDS3AAM and TDS3LIM application modules, TDS3BATB battery pack and AC3000 soft carrying case.

Recommended Accessories

TDS3TMT – Telecom mask testing application module.

TDS3AAM – Advanced analysis module.

TDS3LIM – Limit test module.

TDS3VID – Extended video application module.

TDS3SDI – 601 serial digital video module.

TDS3GV – GPIB, VGA, RS-232 interfaces, and TDSPCS1 OpenChoice™ PC Communication software.

TDSPCS1 OpenChoice™ PC Communication Software – A collection of programs that enable fast and easy transfer communication between MS Windows PCs and Tektronix oscilloscopes. Available in single-license packages and included in TDS3GV communication module.

Minimum System Requirements:

▶ 500 MHz Pentium equivalent or greater

▶ 128 MB

▶ MS Windows 98 SE, XP Professional, Me or 2000

▶ MS Office 2000 or XP (for TDS toolbars only) – Excel 2000 or 2002; Word 2000 or 2002

▶ Keyboard and mouse

▶ LAN, GPIB or serial connector

WaveStar™ Software for Oscilloscopes – Microsoft Windows 98/Me/2000/NT 4.0 Application.

TDS3BATB – Lithium Ion battery pack for up to 3 hours continuous operation without line power.

Note: The instrument must be grounded at all times.

TDS3PRT – Plug-in printer adds easy, portable documentation capability to your TDS3000B or TDS3000 oscilloscope.

Note: Printer operates on battery power only with TDS3000B Series oscilloscope.

016-1907-00 – 5-roll pack of paper for TDS3PRT plug-in thermal printer.

TDS3CHG – Fast charger for battery pack.

AC3000 – Soft case for carrying instrument.

HCTDS32 – Hard plastic case for carrying instrument.

RM3000 – Rackmount kit.

Service Manual (TDS3000B Series) – English only (071-0972-00).

TDS3GV Programmers Manual – English only (071-0381-01).

TNGTDS01 – Self-paced self-study operator training kit.

For customer training on this product outside the U.S. call 1-503-627-7510, inside the U.S. call 1-800-833-9200 ext. 77510.

Recommended Probes

ADA400A – 100X, 10X, 1X, 0.1X high gain differential amplifier.

P6243 – 1 GHz, ≤1 pF input C 10x active probe.

P5205 – 1.3 kV, 100 MHz high voltage differential probe.

P5210 – 5.6 kV, 50 MHz high voltage differential probe.

P5100 – 2.5 kV, 100X high voltage passive probe.

TCP202 – 15 A, DC + peak AC 50 MHz AC/DC current probe.

▶ *Battery pack being installed. The TDS3000B oscilloscope weighs only 4.5 kilograms with battery pack.*

▶ *Plug-in printer provides instant, portable documentation of your work.*

▶ *Tektronix probes are expressly designed for your oscilloscope, with identical quality standards and built-in compatibility for optimum performance.*

International Power Plugs

Opt. A0 – North America power.

Opt. A1 – Universal EURO power.

Opt. A2 – United Kingdom power.

Opt. A3 – Australia power.

Opt. A5 – Switzerland power.

Opt. A6 – Japan power.

Opt. A10 – China power.

Language Options

(includes front panel overlay)

Opt. L0 – English.

Opt. L1 – French.

Opt. L2 – Italian.

Opt. L3 – German.

Opt. L4 – Spanish.

Opt. L5 – Japanese.

Opt. L6 – Portuguese.

Opt. L7 – Simplified Chinese.

Opt. L8 – Traditional Chinese.

Opt. L9 – Korean.

Opt. LR – Russian.

Service

Opt. C3 – Calibration Service 3 Years.

Opt. C5 – Calibration Service 5 Years.

Opt. D1 – Calibration Data Report.

Opt. D3 – Calibration Data Report 3 Years (with Option C3).

Opt. D5 – Calibration Data Report 5 Years (with Option C5).

Warranty

Three year warranty covering all labor and parts, excluding probes.

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▶ **A Critical Component of the Complete Measurement Solution.**
The AFG300 Series arbitrary function generator pairs with the TDS3000B, TDS2000 and TDS1000 Series digital oscilloscopes to deliver the two elements of a complete measurement solution – stimulus and acquisition. This instrument combines the capabilities of a function generator with the power of an arbitrary waveform generator, offering the performance needed to accurately verify, validate and characterize designs with ease and confidence at a price you can afford.

▶ **Tektronix Support Completes the Solution.** We know you depend on Tektronix instrument solutions when you make and meet critical commitments. So we make and meet a support commitment you can depend on. Anytime you need support, anywhere in the world, Tektronix Support gives you the lowest possible exposure to inconvenience, delay or disruption of operations.

– Unsurpassed technical expertise and experience with 24-hour response to technical questions

– Interactive, online support to request assistance, check service status or arrange for training

– Industry-leading, turn-around service time

– Credible, reliable support with demonstrated on-time delivery

– 90-day unconditional service warranty

– No fine print, no exclusions, no surprises

– Global support in more than 50 countries

Depend on Tektronix. Visit www.tektronix.com/support

Our most up-to-date product information is available at:
www.tektronix.com

Product(s) are manufactured in ISO registered facilities.   CE   ISO 9001

Tektronix
Enabling Innovation